

(12) UK Patent Application (19) GB (11) 2 202 993 A (13)

(43) Application published 5 Oct 1988

(21) Application No 8710951

(22) Date of filing 8 May 1987

(30) Priority data

(31) 8707663

(32) 31 Mar 1987

(33) GB

(71) Applicant

Flexicon Systems Limited

(Incorporated in United Kingdom)

PO Box 155, Botanic House, 100 Hills Road,
Cambridge, CB2 1LQ

(72) Inventor

Arthur Thomas Spencer

(74) Agent and/or Address for Service

Keith W Nash & Co

Pearl Assurance House, 90-92 Regent Street,
Cambridge, CB2 1DP

(51) INT CL⁴

H05K 1/18

(52) Domestic classification (Edition J):

H1R AB BS

(56) Documents cited

None

(58) Field of search

H1R

Selected US specifications from IPC sub-class

H05K

(54) Arrangement for mounting a chip carrier on a printed circuit board

(57) An arrangement for mounting a chip carrier (14) to a printed circuit board (10), wherein a lock nut (18) is cemented to the chip carrier to extend through an aperture (28) in a socket moulding (26) and into an aperture (30) in the pcb, the latter also receiving from the opposite direction a mounting screw (36) which screws into the lock nut to clamp the assembly together, with interface contacts (16) on the chip carrier connected to contact pads (12) on the pcb by interconnecting elements principally accommodated in slots (38) in the socket moulding. The interconnecting elements may comprise elastomeric strips having alternate conducting and non-conducting sections, or may comprise individual springs.

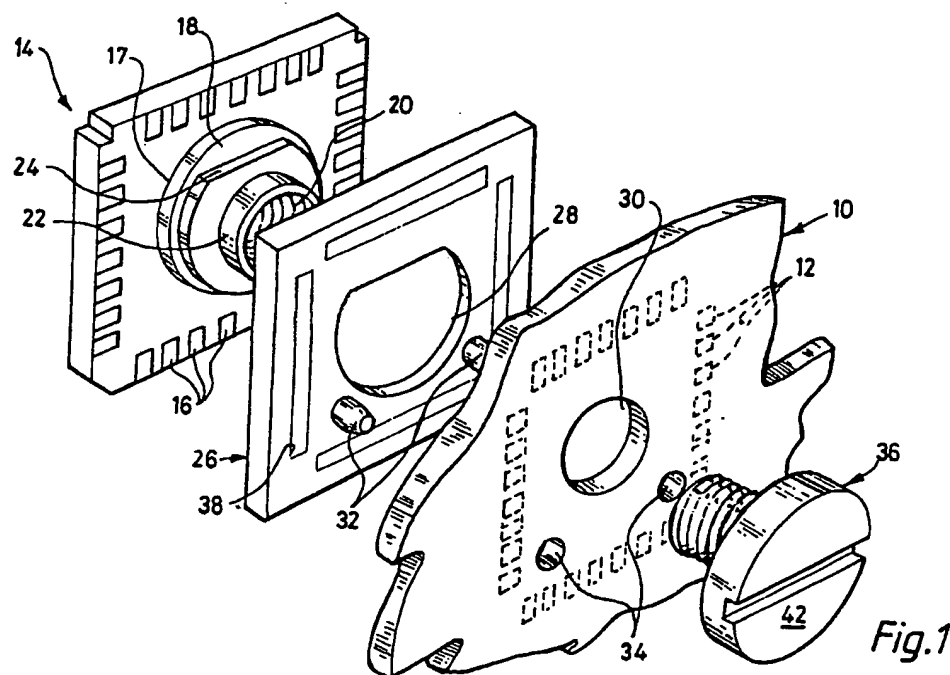


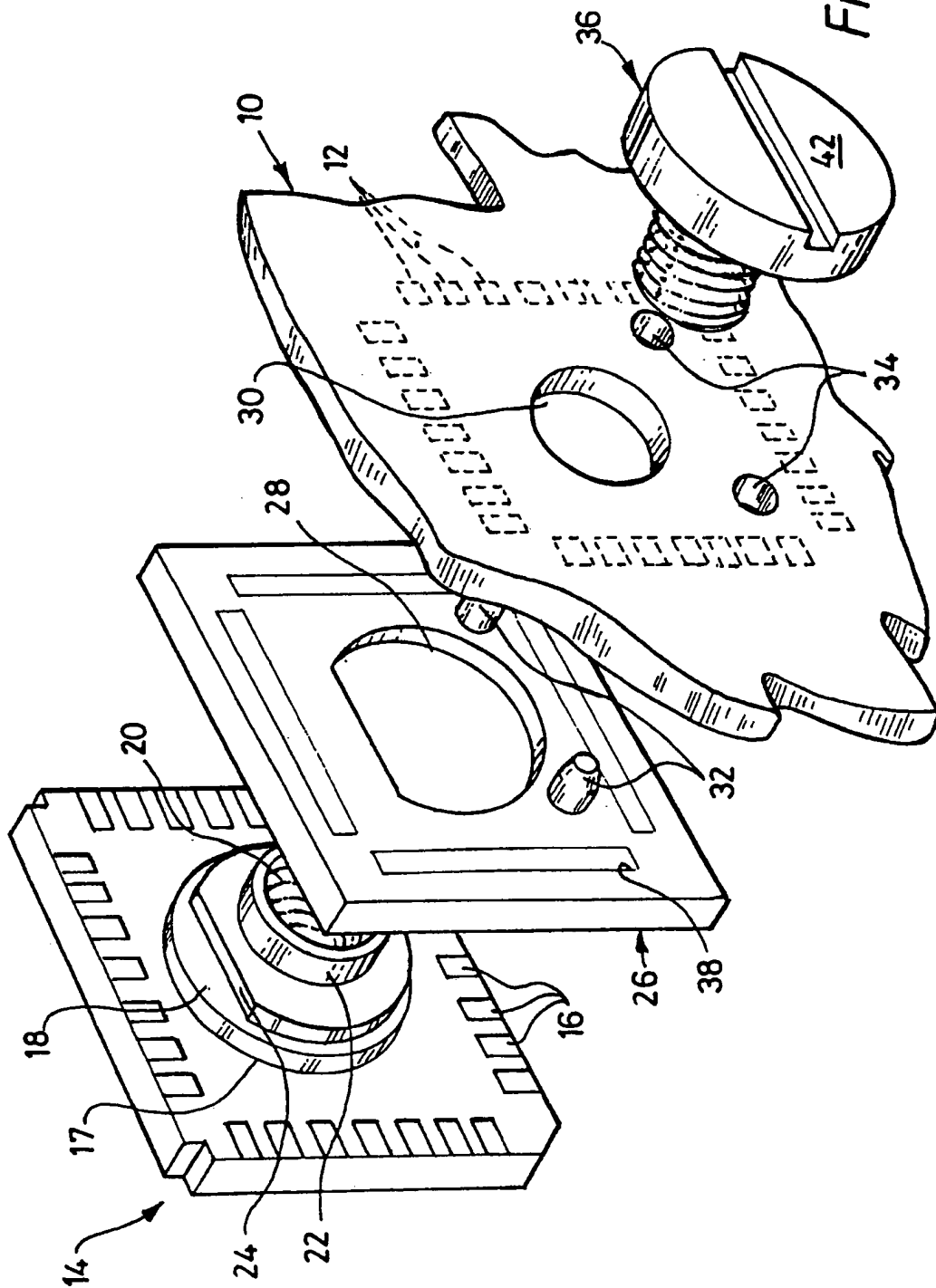
Fig.1

GB 2 202 993 A

2202993

1/2

Fig.1



2202993

2/2

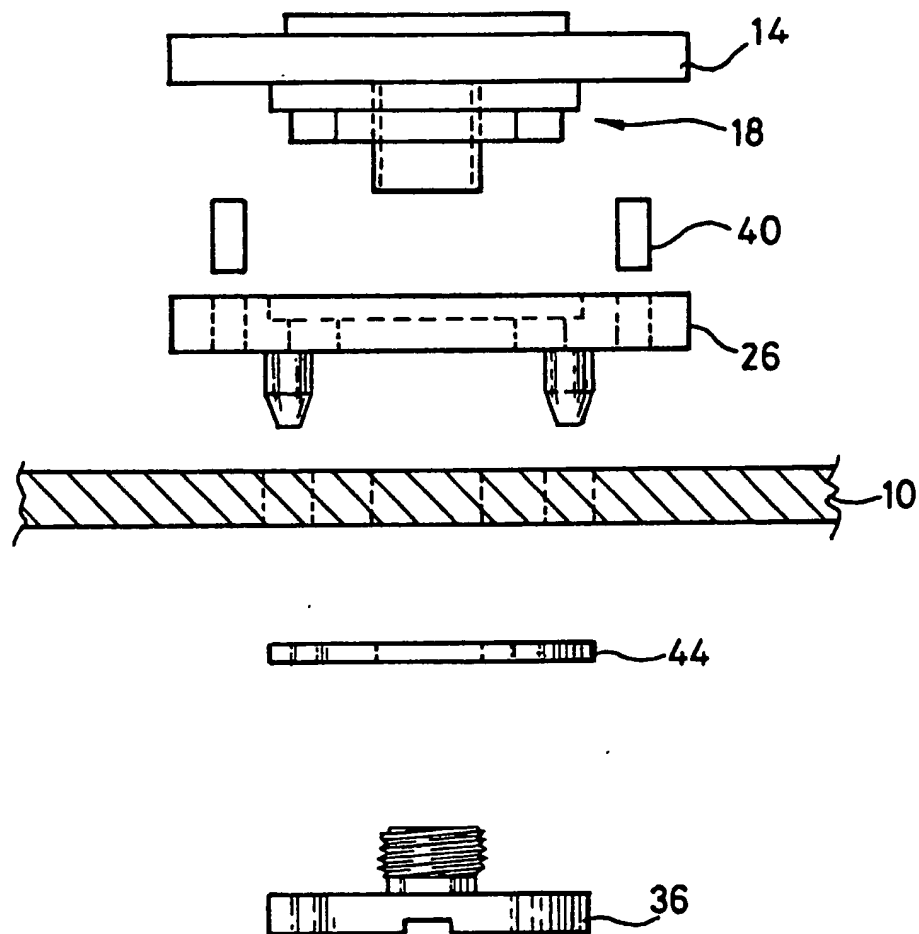


Fig. 2

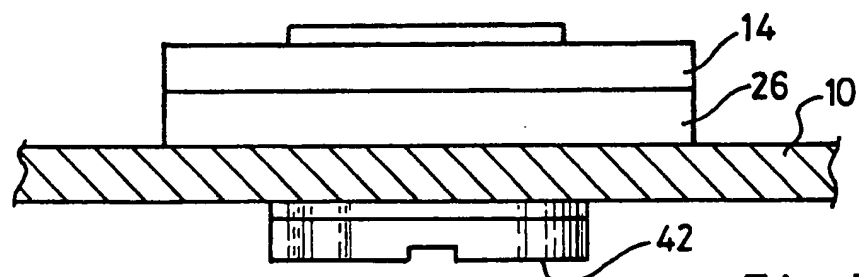


Fig. 3

2202993

- 1 -

C173/F

Title Mounting Arrangement for a Chip Carrier

Field of the invention

This invention relates to an arrangement for mounting an integrated circuit chip carrier to a printed circuit board
5 (pcb) and also to a pcb/chip carrier combination incorporating said mounting arrangement.

Background to the invention

In a mounting arrangement known from U.S. Patent No. 4506938, a socket is cemented to the pcb and receives both
10 a contact interface member equipped with conductive interconnecting elements and the chip carrier, together with a compression spring which acts on the chip carrier to clamp the interface member between said pcb and said chip carrier with the interconnecting elements in
15 electrical contact both with interface contacts on the chip carrier and contact pads on the pcb. In practical form the known arrangement is relatively complicated and there is risk of non-uniformly distributed clamping forces acting at the electrical interfaces.

20 It is an object of this invention to provide an improved arrangement for mounting a chip carrier to a pcb.

The invention

According to one aspect of the invention, there is provided a mounting arrangement for mounting an integrated circuit

- 2 -

chip carrier to a printed circuit board (pcb), comprising a screwthreaded mounting insert for fixedly attaching to the chip carrier, a socket moulding carrying interconnection elements for establishing electrical
5 connections between interface contacts on the chip carrier and interface contact pads on the pcb, said socket moulding being apertured to receive the mounting insert of the chip carrier, and a screwthreaded mounting member for extending through an aperture in the pcb and to be
10 threaded into engagement with the mounting insert to clamp the socket moulding between the chip carrier and the pcb with said interface contacts and said contact pads interconnected by said interconnection elements.

Desirably, the mounting insert and the socket moulding are
15 provided with means for orientating said insert and said moulding so that the interconnecting elements engage the chip carrier interface contacts. Preferably, moreover, the socket moulding and the pcb are provided with means for orientating said moulding and said pcb so that the
20 interconnecting elements engage the pcb contact pads.

In one embodiment, the mounting insert comprises an internally screwthreaded boss externally shaped to be received in a correspondingly shaped aperture of the socket moulding in only one angular orientation of said
25 insert and said moulding, the mounting member comprising a mounting screw. In this embodiment, the socket moulding preferably carries one or more projecting pins to be received in one or more corresponding apertures in the pcb in only one angular orientation of said moulding and said
30 pcb.

The invention also extends to a pcb/chip carrier

- 3 -

combination incorporating the above-described mounting arrangement. Thus, according to another aspect of the invention, there is provided a printed circuit board/integrated circuit chip carrier combination, wherein
5 the chip carrier is mounted to the pcb by means of a mounting insert in the form of a lock nut bonded to the chip carrier and received in an aperture in a socket moulding clamped between the pcb and the chip carrier by a mounting screw which passes through an aperture in the pcb
10 into threaded engagement with the lock nut, the socket moulding also having slots accommodating interconnecting elements which establish conductive contact both with interface contacts on the chip carrier and with contact pads on the pcb.

15 If the mounting screw includes or comprises a conductive portion between the head end and the threaded shank, and the bus on the chip carrier includes a conductive element which will make contact with the conductive portion of the screw, then an electrical path will be established between
20 the pcb and the chip carrier, when the screw is inserted. This will for example allow electrical grounding of the chip carrier to a suitable point on the pcb which may for example make contact with a conductive washer, which may be spring loaded with into contact therewith, hold captive
25 below the screw head.

Typically the screw will be of a conductive material as will also be at least the screw threaded region of the bus on the chip carrier. An electrical connection between the conductive path of the bus (if the whole is not found from
30 conduction material) will complete the path.

Brief description of drawings

- 4 -

The mounting arrangement in accordance with the invention will now be exemplified in the following description, making reference to the accompanying drawings, in which:-

5 Figure 1 is an exploded perspective view of a practical embodiment of mounting arrangement shown somewhat diagrammatically;

Figure 2 is an exploded view of the mounting arrangement in side elevation; and

10 Figure 3 is a side elevational view of an assembled pcb/chip carrier.

Description of embodiment

15 Referring to the drawings, a pcb 10 has on its rear face an arrangement of twenty-eight contact pads 12, positioned in a generally square configuration with seven pads per side.

20 An integrated circuit chip carrier 14 has a corresponding configuration of interface contacts 16 around its square periphery. Cemented or otherwise bonded to the central region 17 of the chip carrier 14 is a mounting insert in the form of a lock nut 18. The nut is internally threaded at 20 within a projecting boss 22, the latter having a flat 24 on its external surface.

25 Reference 26 denotes a socket moulding having a shaped central aperture 28 for receiving the boss 22 of the mounting insert 18 when the chip carrier 14 and the socket moulding 26 are in a correct angular relationship, initially determined when the mounting insert 18 is bonded

- 5 -

to the chip carrier 14.

The pcb 10 has an aperture 30 disposed centrally with respect to the contact pads 12, also receiving the boss 22 of the mounting insert after passage of the latter through the apertured socket moulding 26. Correct angular orientation and positioning of the socket moulding 26 with respect to the pcb 10 is achieved by means of a pair of pins 32 on the socket moulding which engage into a pair of holes 34 formed in the pcb.

10. The parts can be clamped together by a mounting screw 36 which passes through the aperture 30 in the pcb into threaded engagement with the lock nut 18 which constitutes the mounting insert. The socket moulding 26 is thus tightly sandwiched between the chip carrier 14 and the pcb 10.

The socket moulding 26 has four elongated slots 38 arranged in a square configuration which matches that of the contact pads 12 and interface contacts 16. These slots 38 accommodate elastomeric strips 40 (see Figure 2), which each have alternate conducting and non-conducting sections of which the former constitute interconnecting elements for electrically contacting both the interface contacts 16 and the contact pads 12 in order to connect corresponding such contacts and pads together, thereby electrically to connect the i.c. chip carrier with the pcb on which the chip carrier is now mounted. The elastomeric strips 40 could be replaced by individual sprung contact elements, seven per elongated slot 38 in the socket moulding.

30 It will be noted that the mounting screw 36 has an

- 6 -

enlarged head 42 with a flat undersurface for ensuring an even distribution of clamping pressure at the spread electrical interfaces when the parts are assembled. An enlarged locking washer 44 may be interposed beneath the
5 head, as shown in Figure 2.

Figure 3 shows the completed assembly incorporating the mounting arrangement in accordance with the invention.

The mounting arrangement as described is both simple and easily practised without the need of any special tools, as
10 only a screwdriver or the like is required to effect assembly and dis-assembly, thus facilitating servicing and maintenance.

Although the drawing shows four elongated slots 38 in socket moulding 26, arranged parallel to the four edges,
15 each of the slots 38 may be sub-divided if desired for example into two aligned slots to allow pairing.

It is to be noted that screw 36 may be rendered more or less tamperproof by incorporating different tool engaging features in its enlarged head and may be secured using a
20 proprietary locking adhesive if a more permanent bond is required.

Various modifications of the above-described embodiment are possible within the scope of the invention as defined in the appended claims. For example, various means of
25 correctly orientating the chip carrier, socket moulding and pcb contact pads may be employed instead of the means described, and in some instances it may be possible to use a common means for orientating both the socket moulding and the chip carrier with respect to the pcb.

- 7 -

C173/F

Claims

1. A mounting arrangement for mounting an integrated circuit chip carrier to a printed circuit board (pcb), comprising a screwthreaded mounting insert¹⁸ for fixedly attaching to the chip carrier¹⁴, a socket moulding²⁶ carrying interconnection elements⁴⁰ for establishing electrical connection between interface contacts on the chip carrier and interface contact pads on the pcb, said socket moulding being apertured²⁸ to receive the mounting insert¹⁸ of the chip carrier, and a screwthreaded mounting member²⁶ for extending through an aperture in the pcb and to be threaded into engagement with the mounting insert to clamp the socket moulding between the chip carrier and the pcb with said interface contacts and said contact pads interconnected by said interconnection elements.
2. An arrangement according to claim 1, wherein the mounting insert and the socket moulding are provided with means for orientating said insert and said moulding so that the interconnecting elements engage the chip carrier interface contacts.
3. An arrangement according to claim 1 or claim 2, wherein the socket moulding and the pcb are provided with means for orientating said moulding and said pcb so that the interconnecting elements engage the pcb contact pads.
4. An arrangement according to claim 2 or claim 3 when appendant to claim 2, wherein said mounting insert comprises an internally screwthreaded boss externally shaped to be received in a correspondingly shaped aperture of the socket moulding in only one angular orientation of said insert and said moulding, the mounting member

- 8 -

comprising a mounting screw.

5. An arrangement according to claim 3 or claim 4 when
appendant to claim 3, wherein the socket moulding carries
at least one projecting pin to be received in a
5 corresponding aperture in the pcb in only one angular
orientation of said moulding and said pcb.
6. An arrangement according to any one of claims 1 to 5,
wherein said interconnection elements are principally
accommodated in apertures in the socket moulding.
- 10 7. An arrangement according to claim 6, wherein said
apertures are elongate slots each for accommodating a
plurality of interconnecting elements.
8. An arrangement according to claim 7, wherein each
said plurality of interconnecting elements is formed by an
15 elastomeric strip having alternate non-conducting and
conducting sections of which the latter constitute said
interconnecting elements.
9. An arrangement according to claim 4 or any claim
appendant thereto, wherein said boss is dimensioned to
20 extend at least partly through the aperture in the pcb
into which the mounting screw is received, the latter
having an enlarged head with a flat undersurface for
pressing against the pcb around said aperture therein
either directly or through an enlarged washer.
- 25 10. A mounting arrangement for mounting a chip carrier to
a printed circuit board substantially as hereinbefore
described with reference to the accompanying drawings.

- 9 -

11. A printed circuit board (pcb)/integrated circuit chip carrier combination, wherein the chip carrier is mounted to the pcb by means of a mounting insert in the form of a lock nut bonded to the chip carrier and received in an aperture in a socket moulding clamped between the pcb and the chip carrier by a mounting screw which passes through an aperture in the pcb into threaded engagement with the lock nut, the socket moulding also having slots accommodating interconnecting elements which establish conductive contact both with interface contacts on the chip carrier and with contact pads on the pcb.

12. A printed circuit board/chip carrier combination substantially as hereinbefore described with reference to the accompanying drawings.